

What is claimed is:

1. A scanning electron microscope comprising:

an electron source to radiate an electron beam;

an objective lens system to focus the radiated electron beam on a sample;

a scanning system to scan said focused electron beam on said sample;

a secondary electron detection system to detect secondary electrons emitted from said sample; and

a secondary electron image displaying system to display a secondary electron image of said sample with a secondary electron detection signal from said secondary electron detection system; wherein

said objective lens system is composed of a first objective lens and a second objective lens;

said first objective lens is arranged on a side near to said electron source;

said second objective lens is disposed adjacent to said first objective lens and is arranged on a side near to said sample;

said scanning system is a scanning coil;

said secondary electron detection system is a secondary electron detector that is provided on the electron source side of said objective lens system; and

said first objective lens is mainly excited when a wide visual field mode is used and said second objective lens is mainly excited when a high resolution mode is used.

2. A scanning electron microscope comprising:

an electron source to radiate an electron beam;

an objective lens system to focus the radiated electron beam on a sample;

a scanning system to scan said focused electron beam on said sample;

a secondary electron detection system to detect secondary electrons emitted from said sample; and

a secondary electron image displaying system to display a secondary electron image of said sample with a secondary electron detection signal from said secondary electron detection system; wherein

said objective lens system is composed of a first objective lens and a second objective lens;

said first objective lens is arranged on a side near to said electron source;

said second objective lens is disposed adjacent to said first objective lens and is arranged on a side near to said sample;

said scanning system is a scanning deflective electrode;

said secondary electron detection system is a secondary electron detector that is provided on the electron source side of said objective lens system; and

said first objective lens is mainly excited when a wide visual field mode is used and said second objective lens is mainly excited when a high resolution mode is used.

3. A scanning electron microscope according to claim 1, wherein when a wide visual field mode is used, said first objective lens is mainly excited, and said second objective lens is dependently excited in a direction opposite to an excitation direction of said first objective lens to cancel off-axis chromatic aberration.

4. A scanning electron microscope according to claim 2, wherein when a wide visual field mode is used, said first objective lens is mainly excited, and said second objective lens is dependently excited in a direction opposite to an excitation direction of said first objective lens to cancel off-axis chromatic aberration.

5. A scanning electron microscope according to claim 1, wherein at least one of said first objective lens and said second objective lens is formed of a plurality of exciting coils.

6. A scanning electron microscope according to claim 2, wherein at least one of said first objective lens and said second objective lens is formed of a plurality of exciting coils.

7. A scanning electron microscope according to claim 5, wherein a plurality of exciting coils, which are not mainly excited, are excited in a direction opposite to each other; synthesized magnet-motive force is composed to become substantially zero; and thermal change is hard to generate even though the mode is changed.

8. A scanning electron microscope according to claim 6, wherein a plurality of exciting coils, which are not mainly excited, are excited in a direction opposite to each other;

synthesized magnet-motive force is composed to become substantially zero; and

thermal change is hard to generate even though the mode is changed.

9. A scanning electron microscope according to claim 1, wherein said first objective lens is provided with two pairs of separated coils in which a first pair of separated coils is composed of two separated coils spaced in a main axis direction of said objective lens system;

a yoke is disposed between said first pair of separated coils and a second pair of separated coils;

when the wide visual field mode is used, magnet-motive forces in a same direction are generated in each separated coil of the first pair of separated coils, and magnet-motive forces in a same direction are generated in each separated coil of the second pair of separated coils, but opposite magnet-motive force is generated from the generated magnet-motive force in the first pair of separated coils; and

when the high resolution mode is used, said magnet-motive forces of the first objective lens are canceled by generating magnet-motive forces in a direction opposite to each other in each separated coil which is composed as one pair.

10. A scanning electron microscope according to claim 2, wherein said first objective lens is provided with two pairs of separated coils in which a first pair of separated coils is composed of two separated coils spaced in a main axis direction of said objective lens system;

a yoke is disposed between said first pair of separated coils and a second pair of separated coils;

when the wide visual field mode is used, magnet-motive forces in a same direction are generated in each separated coil of the first pair of separated coils, and magnet-motive forces in a same direction are generated in each separated coil of the second pair of separated coils, but opposite magnet-motive force is generated from the generated magnet-motive force in the first pair of separated coils; and

when the high resolution mode is used, said magnet-motive forces of the first objective lens are canceled by generating magnet-motive forces in a direction opposite to each other in each separated coil which is composed as one pair.

11. A scanning electron microscope according to claim 1, wherein said first objective lens and said second objective lens comprise an exciting coil and a yoke respectively; and

one part of the yoke constituting said first objective lens and one part of the yoke constituting said second objective lens are shared.

12. A scanning electron microscope according to claim 2, wherein said first objective lens and said second objective lens comprise an exciting coil and a yoke respectively; and

one part of the yoke constituting said first objective lens and one part of the yoke constituting said second objective lens are shared.

13. A scanning electron microscope according to claim 1, wherein said first objective lens system and said second objective lens system are disposed concentrically; and

said first objective lens system is disposed inside said second objective lens system. 13.

14. A scanning electron microscope according to claim 2, wherein said first objective lens system and said second objective lens system are disposed concentrically; and
said first objective lens system is disposed inside said second objective lens system.